

Appl. No.09/942,628
 Attd. dated April 4, 2007
 Reply to Office action of January 11, 2007
 Atty. Docket No. AP1102US

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REMARKS/ARGUMENTS

Claims 2, 3 and 10 - 40 are pending in the application.

Claims 2, 3, 10 - 24 and 30 - 35 are allowed.

Claims 25 - 28 and 36 - 39 have been amended.

Claims 25 - 29 and 36 - 40 were rejected under 35 U.S.C. § 112 on the grounds that "Separating the sub-band signals ..." as claimed in claims 25 and 36 is not supported by the Specification. This rejection is respectfully traversed.

As explained to the examiner during the telephone interview mentioned in the Office Action, although the actual phrase "separating the sub-band signals" did not appear in the specification as filed, the function of separating the sub-band signals at the receiver was clear from the drawings and description when read, by the notional skilled person, with a desire to understand them. During a brief subsequent telephone interview on receipt of the office action, the examiner asserted that "separating means" could not be claimed explicitly because it was not shown in the drawings, specifically Figure 4. In fact, Figure 4 does show the "separating means", namely the bank of filters to which the combined SIGNAL IN is applied in common. Each filter passes only its own sub-band, so the bank of filters provides the function of separating the sub-bands.

The examiner has not disputed that the transmitter shown in FIG. 3 combines the sub-band signals of BAND 1, BAND 2 ... BAND K, specifically by means of the summer which combines the outputs of filters FILTER 1, FILTER 2 FILTER K to form the signal SIGNAL OUT which is transmitted to the receiver, typically by way of a telephone line.

The signal received by the receiver, shown in Fig. 4 as SIGNAL IN, comprises the signal SIGNAL OUT, i.e., comprising the combined sub-band signals. These sub-band signals have to be separated into individual sub-band signals corresponding to BAND 1, BAND 2 ... BAND K before they can be individually downsampled, FFT transformed and demodulated. The receiver of FIG. 4 has no direct equivalent to the summer of FIG. 3 because it is not needed; the combined signal SIGNAL IN is simply applied, in common, to each of the filters FILTER 1, FILTER 2 ... FILTER K and each filter separates or selects its own sub-band signal for processing in its own channel or band, i.e., identified as BAND 1, BAND 2, ..., BAND K in FIG. 4.

This would have been apparent to one skilled in this art from the original description and drawings, taking into account the common general knowledge of one skilled in this art. Notwithstanding that, in view of the difficulty experienced by the examiner in interpreting the description and reading the wording of claims 25 and 36 onto the description, the description has been amended to make it clearer that the combined signal SIGNAL IN is separated into the individual sub-band signals by the plurality of filters FILTER 1, FILTER 2 ... FILTER K. Also, claims 25 and 26 have been amended to make this clearer. The amendments to dependent claims

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26 - 28 and 37 - 39 are for consistency with the wording of claims 25 and 36. The amendments to page 3 of the description do not add subject matter but merely clarify what was apparent to a person skilled in this art from the drawings and description as originally filed.

Accordingly, it is submitted that claims 25 and 36, as amended, the claims dependent upon them, and the supporting description, are enabling and it is requested that the rejection under 35 U.S.C. § 112 be withdrawn.

Claims 25 and 36 were rejected also under 35 U.S.C. § 102(e) as anticipated by Wallace *et al.* This rejection is respectfully traversed.

Claims 25 and 36 are directed to a receiver and reception method for receiving a signal (SIGNAL IN) which comprises a plurality of sub-band signals which have combined and then transmitted, usually via a single subscriber line, such as a single twisted wire pair. Both the receiver and reception method must separate the sub-band signals so that they can be processed individually. This is done using a corresponding plurality of filters, FILTER 1, FILTER 2, ..., FILTER K in FIG. 3.

Wallace *et al.* disclose a multiple-input/multiple output (MIMO) scheme which does not combine sub-band signals for transmission and so does not separates combined sub-band signals upon reception. In fact, the essence of a multiple-input/multiple output (MIMO) scheme is that the signals are kept separate, to the extent that the receiver has separate antennas 610A, ..., 610R (Wallace *et al.*, FIG. 6). Accordingly, claims 25 and 36 are not anticipated by the Wallace *et al.* disclosure. For further discussion as to the irrelevance of the Wallace *et al.* disclosure, attention is directed to applicant's previous response filed November 10, 2006.

Claims 26, 27, 37 and 38 were rejected under 35 U.S.C. § 103(a) as unpatentable over Wallace *et al.* in view of Murakami (US 6,317,409). This rejection is respectfully traversed. These claims are dependent directly or indirectly upon one or other of claims 25 and 36 and so include their features. Thus, in so far as Wallace *et al.* do not disclose reception of a signal, SIGNAL IN, comprising combined sub-band signals, and separation of the sub-band signals for individual processing, the combination of Wallace *et al.* with Murakami cannot establish a *prima facie* case of obviousness and the rejection cannot stand. It follows that claims 26, 27, 37 and 38 are patentable with, and for the same reasons as, claims 25 and 36.

Claim 28 was rejected under 35 U.S.C. § 103(a) as unpatentable over Wallace *et al.* in view of Murakami (US 6,317,409) "as applied to claims 17, 2, 3, 20 - 22, 25 - 27 above, and further in view of Kim et al. (US 6,690,717). This appears to have been a clerical error since claims 17, 2, 3 and 20 - 22 have been allowed.

So far as claims 25 - 27 are concerned, the rejection is respectfully traversed. Claims 25 - 27 all require a receiver that can receive a SIGNAL IN comprising combined sub-band signals and

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separate the sub-band signals out for individual processing. As explained above, Wallace *et al.* do not disclose such a receiver. Claims 25 - 27 dependent upon claim 25 and 36 and so include its features. Thus, in so far as Wallace *et al.* do not disclose reception of a signal, SIGNAL IN, comprising combined sub-band signals, and separation of the sub-band signals for individual processing, the combination is inadequate to support a *prima facie* case of obviousness.

Also, a skilled person would not seek to combine Wallace *et al.*'s MIMO receiver with those disclosed by Murakami and Kim because they represent completely different approaches.

It follows that claim 25 - 27 are patentable over the cited references, whether taken individually or in combination.

In view of the foregoing, it is submitted that all claims of record are patentable over the cited references and early and favourable reconsideration of the application is respectfully requested.

Respectfully submitted,



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